R E M A R K S

Reconsideration of this application is respectfully requested.

Claims 1-9 have been rejected under 35 USC 103 as being obvious in view of the combination of newly cited USP 5,327,987 ("Abdelmalek") and previously cited USP 3,097,490 ("Callan et al"), as well as in view of the combination of Abdelmalek and previously cited USP 3,994,137 ("Yasumoto et al"). These rejections, however, are respectfully traversed.

According to the present invention as recited in independent claim 1, there is provided a method of controlling a closed heating system for generating energy from heat by managing a flow of a working medium through an expansion device included in the closed heating system. As recited in independent claim 1, in addition to the expansion device, the closed heating system also includes a condenser, a pump and a boiler, wherein the expansion device comprises a helical screw rotor expander that has an inlet port and an outlet port connected to an inlet of the condenser, and wherein the condenser comprises an outlet connected to an inlet of the pump, the pump comprises an outlet connected to an inlet of the boiler, and the boiler comprises an outlet connected to the inlet port of the helical screw rotor expander through an inlet line. In addition, as recited in independent claim 1, the expansion device drives an energy producing device. Significantly,

as recited in independent claim 1, the method comprises providing the helical screw rotor expander with an intermediate pressure port between the inlet port and the outlet port, by connecting the intermediate pressure port with the inlet line via a branch line between the intermediate pressure port and a branching point in the inlet line. Still further, as recited in independent claim 1, a valve is included in the branch line, and the flow of the working medium through the valve to the intermediate pressure port is controlled as a function of a state parameter.

Similarly, according to the present invention as recited in independent claim 6, there is provided a closed heating system for generating energy from heat including an arrangement for controlling a flow of a working medium through an expansion device included in the closed heating system, wherein the closed heating system further includes a condenser, a pump, a boiler, and requisite connection lines. As recited in independent claim 6, the expansion device includes a helical screw rotor expander that has an inlet port and an outlet port connected to an inlet of the condenser, wherein the condenser comprises an outlet connected to an inlet of the pump, the pump comprises an outlet connected to an inlet of the boiler, and the boiler comprises an outlet connected to the inlet port of the helical screw rotor expander through an inlet line. In addition, as recited in independent claim 6, the expansion device drives an

energy producing device. And significantly, as recited in independent claim 6, the helical screw rotor expander includes an intermediate pressure port between the inlet port and the outlet port, wherein a branch line connects the intermediate pressure port with the inlet line at a branching point, and a valve is provided in the branch line.

On page 3 of the Final Office Action, the Examiner asserts that Abdelmalek discloses "a helical screw expander (109) with a pair of helical rotors 303, 304 in figure 3, with many ports including inlet port, intermediate port, and outlet port. . ." (emphasis added). Applicant respectfully disagrees.

According to Abdelmalek, the screw expander 300 only has an inlet 309 and an outlet 310. See Column 7, lines 15-39 and Figs. 3 and 4 of Abdelmalek. Therefore, it is respectfully submitted that Abdelmalek clearly does not at all disclose or suggest an intermediate port as according to the claimed present invention.

On pages 3 and 4 of the Final Office Action, the Examiner acknowledges that "Abdelmalek does not disclose the concept of connecting the intermediate port with a branch line from an inlet port, said branch line having a valve being responsive to a state parameter." That is, according to the Examiner, Abdelmalek does not disclose that the intermediate port thereof is connected to a

branch line having a valve. For this reason, the Examiner has cited either of Callan et al and Yasumoto et al.

However, as pointed out hereinabove, Abdelmalek does not disclose or suggest an intermediate port of a helical screw rotor expander in the first place. Therefore, since Abdelmalek does not have an intermediate port to which branch lines with valves as taught by Callan et al or Yasumoto et al can be connected, it is respectfully submitted that Abdelmalek is not combinable with Callan et al in the manner suggested by the Examiner on page 3 of the Final Office Action, and it is respectfully submitted that Abdelmalek is not combinable with Yasumoto et al in the manner suggested by the Examiner on page 4 of the Final Office Action.

It is respectfully submitted, moreover, that even if the teachings of Abdelmalek were combinable with Callan et al and/or Yasumoto et al in the manner suggested by the Examiner (that is, even if it were assumed that Abdelmalek has an intermediate port to which branch lines with valves as taught by Callan et al or Yasumoto et al can be connected), for the reasons set forth hereinbelow, it is respectfully submitted that any such combination still would not achieve or render obvious the structural features of the present invention as recited in independent claim 1 and 6.

According to Callan et al, valves 3 are located in inlet branches and regulation is achieved by opening one or more of the

valves 3, which can be done in sequence (see column 3, line 1 and lines 37-38). However, the regulation made by the valves 3 in Callan et al is of a completely different type than the function of the intermediate pressure port of the claimed present invention.

On page 2 of the Final Office Action, the Examiner asserts that the "first line and the last line of Callan are clearly directed to the intermediate ports". Applicant respectfully disagrees, and submits that none of the (four) branches having the valve 3 in Callan et al lead to an intermediate pressure port. That is, it is respectfully submitted that the ports to which the first and last branch lines are connected in Callan et al are not intermediate pressure ports. As shown in Fig. 1 of Callan et al, all four lines are connected to the high pressure inlet of the turbine 5. And it is respectfully submitted that the fact that the first and last branch lines in Fig. 1 are drawn to reach the turbine 5 on the conical part thereof instead of at the small end (where the two middle branch lines are connected) does not indicate that the first and last branch lines are connected to intermediate pressure ports. Apparently, the reason why the first and last branch lines in Fig. 1 are drawn to reach the turbine 5 on the conical part thereof is merely for the purpose of making Fig. 1 clear, since the space at the small end is too narrow. If connection to an intermediate pressure port

had been intended, it is respectfully submitted that the first and last lines would have been drawn such that they end considerably towards the middle of the cone instead of very close to the small end. Even that, however, cannot be clearly interpreted as connection to an intermediate pressure port, since a turbine 5 does not define different pressure zones in the manner of the helical screw expander of the claimed present invention. Therefore, it is respectfully submitted that the first and last branch lines of Callan et al do not correspond to the branch line as recited in independent claims 1 and 6 of the present invention.

In addition, it is respectfully pointed out that Callan et al is directed to an open steam power system. By contrast, Abdelmalek is directed to a closed heating system, which is completely different from the open steam power system of Callan et al. That is, the expansion device of Callan et al is not of a displacement type as is a helical screw expander, but is of a dynamic type, i.e. a turbine. And turbines as disclosed in Callan et al do not have a defined intermediate pressure zone to which an intermediate pressure port could be connected. For this reason also, it is respectfully submitted that Callan et al is not combinable with Abdelmalek in the manner suggested by the Examiner.

Yasumoto et al, moreover, merely discloses that expansion takes place in a multi-stage turbine wherein valves 18 and 19 are provided for regulating the extent to which the different stages are activated. By contrast, according to the claimed present invention, the expansion device is one single unit, namely the screw rotor expander. It is respectfully submitted that Yasumoto et al does not disclose providing one unit with an intermediate port between the inlet port and the outlet port, but rather discloses a high pressure turbine with an inlet and an outlet and a separate second turbine of lower pressure with an inlet and an outlet. And it is respectfully submitted that contrary to the Examiner's assertion on page 4 of the Final Office Action, the ports of the intermediate turbine 2 of Yasumoto et al do not correspond to the intermediate pressure port of the expander of the claimed present invention.

Still further, the valves in Yasumoto et al are merely used to regulate the cooperation between the stages. And it is respectfully submitted that the even if Yasumoto et al discloses an intermediate pressure port, the valves corresponding thereto are not controlled as a function of a state parameter as according to the present invention as recited in independent claim 1. Indeed, according to Yasumoto et al, the main purpose of the arrangement is for starting up the system. Accordingly, it is respectfully submitted that the branch line 26 of Yasumoto

et al does not correspond to the branch line as recited in independent claims 1 and 6 of the present invention.

Still further, like Callan et al, Yasumoto et al also relates to a dynamic expansion device, which is contrary to the cited prior art reference Abdelmalek that relates to a displacement expansion device. Therefore, it is respectfully submitted that Yasumoto et al is also not combinable with Abdelmalek in the manner suggested by the Examiner.

In summary, it is respectfully submitted that the cited prior art references, even if combinable, do not achieve or render obvious the structural features of the present invention as recited in the independent claim 1 and 6.

In view of the foregoing, it is respectfully submitted that the present invention as recited in independent claims 1 and 6, and claims 2-5, and 7-9 respectively depending therefrom, clearly patentably distinguishes over all of the cited prior art references of record, taken singly or in any combination consistent with the respective fair teachings thereof, under 35 USC 103.

RE: THE DRAWINGS

It is again respectfully requested that the Examiner check item 10 of the Office Action Summary sheet to indicate that the

drawings filed with the application papers have been accepted as formal drawings.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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